Obesity, Prejudice, Bariatric Surgery and its Funding

A study of fund rationing for bariatric surgery

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Acknowledgements

- I would like to take this opportunity to thank Professor John Baxter for his guidance, his infectious enthusiasm, and his tolerance of my intrusion into his surgery, clinic, and his busy schedule.

- I would also like to thank Dr. James Moffat for his fascinating conversations about obesity, for allowing me to join his research, and for the loan of his notes which unbeknown to him now look as though they have been used as a nesting material for a family of small rodents.

- Thank you also to the patients I have spoken to during Professor Baxter's surgery and clinics. Their insight into obesity has been invaluable.

- I would also like to thank the numerous health care professionals that work with obesity for the information, and time you have given to my work.

- Lastly, but not least, I would like to thank the forum community of diabetes.co.uk for their stimulating discussion of diet and obesity.

Introduction

Prevalence of Obesity

Obesity is becoming an increasingly prevalent healthcare problem in the UK and the world over with 38 percent of adults in the UK being overweight and 24% obese in 2006. A greater proportion of men than women were overweight (43 percent compared with 32 percent). In 2006, 24 percent of adults (aged 16 or over) in England were classified as obese. This is almost double the 15 percent observed in 1993 demonstrating an alarming increase in population obesity[1] [2]. In 2002 the National Institute for Health and Clinical Excellence (NICE) estimated there were 1.2 million morbidly obese (BMI > 40 kgm^{-2}) people in England and Wales, and that this would increase by 5% per annum.

Co-morbidity

Obesity has a significant number of serious co-morbidities, such as Type II Diabetes, Heart Disease, Hypertension, Sleep Apnoea, Osteoarthritis, Gall Bladder Disease, Fatty Liver Disease, Cancer, Asthma, Chronic headaches, Varicose veins, Coronary artery disease, GORD, and Hernias. Each of these carries a significant burden upon the NHS budget, as well as being a significant cause for public concern. The loss of life expectancy in obese patients is extremely significant with a loss of 12 years of life for a 25 year old morbidly obese man[3]. Obesity is also linked to increased levels of anxiety and depression[4] [5].

Cost of Obesity

In 2006 NICE estimated that the costs to the United Kingdom from obesity are between £6.6 billion - £7.4 billion per annum. These costs are due to the increased prescriptions received, higher frequency of medical contact, and loss of productivity associated with obesity (estimated at £2 billion by the National Audit Office, 2001).

Dietary Intervention

Traditionally, the first choice for treatment of obesity has been through the modification of diet. Indeed, even without being aware of the significant health risks associated with obesity, many people have been motivated to undertake diet alteration regimes for reasons such as aesthetics, lifestyle, and to avoid prejudice. The need for dietary weight control has been so popular that it has supported global multi billion pound business. There are no official statistics for spending on diet products, but estimates vary from $40bn to $100bn in the US[6] alone. Despite the large amounts of money and effort we spend on dietary weight control, the evidence suggests the results are poor in the long term with up to 66 percent of patients regaining their weight within 2 years[7-9].

Pharmacotherapy

In conjunction with dietary modification, better success has been observed in the short term (up to 4 years) with pharmacotherapy (e.g. Orlistat, Sibutramine, Rimonabant). Patients receiving drug treatment are more likely to achieve 5 percent and 10percent weight loss thresholds[10 11], however, the long term results are also disappointing with 90 percent of people regaining their weight upon cessation of the drug[11 12].

The consensus of the NICE advisory group on obesity was that Of the total population with a BMI of 35 kg/m2 or more with co-morbidities, and those with a BMI of 40 kg/m2 or more, 90 to 95 percent are unlikely to achieve or maintain clinically beneficial weight loss through non-surgical means. Despite the poor long term outcome of dietary modification and pharmacotherapy, these are still the medical treatment of choice, meaning thousands of obese patients in the UK are receiving inadequate treatment of their obesity, and have little hope of avoiding the associated co-morbidities and an early death. This appears even more unjust in light of the evidence that a beneficial, cost effective treatment for obesity already exists.

Bariatric Surgery

A Cochrane review in 1997 illustrated that bariatric surgery was an effective intervention for obesity, demonstrating good results in evidence[13]. In contrast to the bleak long term results obtained by dietary and pharmacotherapy treatments bariatric surgery has been shown to result in excess weight loss of over 61% in a meta-analysis[14] which was sustainable at 10 – 15 year follow up. The 'Swedish Obese Subjects' study compared surgical, pharmacological, and lifestyle alteration therapy, demonstrating a tenfold increase in the success of surgical intervention compared to non surgical after 10 years[15-17].

More importantly this success can also be shown in the reduction of obesity related mortality, and morbidity. Sjöström *et al*[18] demonstrated in 2007 that surgery decreased the overall mortality of obese patients, with a hazard ratio compared to the control group and adjusted for age, sex, and risk factors, of 0.71 (p=0.001). An earlier study by Pories *et al*[19] in 1995 also demonstrated the impact of bariatric surgery upon type II diabetes stating *"No other therapy has produced such durable and complete control of diabetes mellitus."* This study also demonstrated bariatric surgery to correct or alleviated other co-morbidities of obesity, including hypertension, sleep apnoea, cardiopulmonary failure, arthritis, and infertility stating "*Gastric bypass is now established as an effective and safe therapy for morbid obesity and its associated morbidities.*"

NICE and Bariatric Surgery

The National Institute for Clinical Excellence (NICE) was established by the Government in order to examine medical interventions and advise on whether, and to what extent, they should be made available. Their approach is strictly technical, with an emphasis on health gain measured in quality adjusted life years (QALYs) in relation to cost. Recommendations made by the advisory group formed by NICE stated that patients between the ages of 18 - 55 with a BMI of 40 kg/m2 or more (or with a BMI of 35 kg/m2 or more with co-morbidities present) should be considered for bariatric surgery if previous concerted attempts for weight loss have been unsuccessful. It also recommends that patients with a BMI of 50 kg/m2 or more should be offered bariatric surgery as first line treatment with no previous attempts at weight loss.

NICE estimate, based on statistics the 2004 'Health survey for England' (HSE) to the English population, that around 680,000 people in England, or 1.4% of the population, have a BMI of 40 kg/m2 or more[20]. Nice also estimate using data from the 2003 HSE that, of those who have a BMI of 40 kg/m2 or more, 47,000 (7 percent of them) have a BMI of 50 kg/m2 or more. This means that there are around 47,000 people in England who are eligible for bariatric surgery as first-line treatment for their obesity, and up to 680,000 for whom surgery is considered only when other forms of medical management have been attempted but adequate clinically beneficial weight loss has not been achieved or maintained. This translates nationally to approximately 1,070,000 people for the whole of the UK.

Based on these figures the NICE advisory group recommend that around 1.6% of the population eligible and willing could be treated each year, which is around 4.800 people a year, given appropriate investment in services over the next 5 years. Therefore they recommend, in 5 years time, a population benchmark of 0.01% or 10 per 100,000

Current Surgical Activity

Despite these recommendations the actual numbers of procedures performed have been woefully inadequate. A survey of surgeons performing bariatric surgery in England in 2006 (survey by BariatricEdge, a division of Ethicon Endo Surgery: a Johnson & Johnson company,

unpublished data) estimated that the average rate of bariatric surgery funded by the NHS was around 3 per 100,000 population. In a population of 51 million this equates to approximately 1,530 NHS procedures being performed on the NHS. These figures fall extremely short of the current need.

More depressing still are the statistics for Wales. Wales has a population of approximately 2.9 million, and performs between 11 and 30 procedures per year on the NHS. This is less than 0.001% of the population, and is less than a tenth of the standard of 0.01% of the population recommended by NICE.

Funding

In order to provide an adequate bariatric service there must be the provision of surgeons, infrastructure, and adequate commissioning, all of which require funding. It is the lack of funding which is preventing the effective treatment of obesity in the United Kingdom, and is directly contributing to needless early death and lower quality of life for its thousands of sufferers. The issue of fund rationing is a complicated one, which is embroiled in ethics, law, and health economics.

General Study Aims

This study will investigate the issues of funding related to bariatric surgery, determine how and why funds are rationed, and attempt to understand where bariatric surgery features on the list of priorities for Welsh fund holders. It will also attempt to determine the view of the public on obesity and bariatric surgery and determine why it does not have access to the fair ration of funding that it deserves.

Specific Study Aims 1

1. To learn about the bariatric surgery service
2. To understand the need for the bariatric service to society
3. To understand the way funds are allocated to services in Wales
4. To understand how funds are specifically allocated to bariatric services in Wales

Healthcare Economics in Wales

Welsh Assembly Government

The Welsh Assembly Government (WAG) provides money for the care of the people of Wales, as revenue allocations to bodies such as the National Health Service (NHS) and in the form of health improvement initiatives. WAG claims these initiatives encourage organisations to work together to improve the health of the nation[21]. The Welsh Assembly Government receives money from the HM Treasury, some in the form of tax collected on behalf of the UK

Government by the Chancellor of the Exchequer, and some as an annual grant from the Secretary of State for Wales.

Health Commission Wales

The NHS receives a particular type of funding known as revenue allocations. This is money given to the Local Health Boards and the Health Commission for Wales (HCW) to cover the day to day running costs of the NHS in Wales during each financial year. Bariatric Surgery is identified as a HCW commissioning responsibility in Welsh Health Circular WHC (2003) 63. The HCW are responsible for managing the totality of their budget, and making the best use of all available resources.

HCW has developed a commissioning policy for access to NHS funded bariatric surgery. The Policy was supported by the National Commissioning Advisory Board (NCAB) in April 2006. Patients are initially assessed against agreed eligibility criteria. Those patients who fulfil the criteria are referred to HCW Individual Patient Commissioning (IPC) Panel. The IPC Panel reviews each case on an individual basis and only cases that are assessed as 'exceptional' in nature are approved/recommended for treatment. (approved for North Wales, recommended in relation to South and Mid Wales). The implication of this is that non-exceptional obesity is given no consideration, and there is no effective Welsh initiative to combat the growing problem of obesity. Given that approval was given to only 12 people this year in Wales the relatively low priority accorded to bariatric surgery in HCW commissioning plans is reflected very strongly.

Rationing

HCW receives a limited amount of funds each year, with which it inevitably has to ration among all its services. One can understand the apprehension of funding additional services given the limitation of funds, however there is significant evidence demonstrating that a bariatric service will save the NHS money due to the decrease in co-morbidity[22-26]. The cost effectiveness combined with the growing impact of obesity upon the nation's health would seem to be a compelling technical argument for need for bariatric surgery. One would imagine that funds would be allocated according to this technical need, but this is clearly not so. Contrarily, it seems, funding is often allocated to technically inefficient services such as ITU, and a purely technical rationing principle would require it necessary to disregard the patient's charter.

The non-technical approach to NHS rationing was illustrated strongly in the 2002 High Court ruling regarding the prescription of Viagra[27]. The court made the point that what should be paid for by the NHS is a political rather than technical matter, and that QALYs (which are fundamental to NICE recommendations) cannot assist in deciding which services get priority in NHS funding. This seems very counter-intuitive. On one hand the High Court believes decisions involving rationing should be non-technical and political, but on the other funding decisions are being made locally by non-political bodies.

It would seem then, we have two theories for healthcare rationing, each with its supporters. The Technocrats and the Political Realists, the former advocating a pragmatic, evidence based method of analysis, and the latter advocating a process for decision making based on social and political values. This is possibly a reflection of the disparity between healthcare providers' and purchasers' perceived role of the NHS. A purely technical provider's approach would seem to be the most beneficial to society in terms of supplying the maximum heath care benefit for the least cost; however it is apparent that purchasers don't view the NHS as a mechanism of improving the health of the nation as a whole. The purchaser views the NHS in a more individualistic way, treating it as a safety net, almost like an insurance policy against poor health. Curiously, taxes levied to fund the NHS are euphemistically called National 'Insurance' contributions, and the unique selling point for insurance is it offers security and peace of mind. Ironically delivering a healthcare system that makes the purchaser feel more secure is likely to be one that offers the least health benefit.

While advocates of both theories attempt to reach a common ground they are starting to realise there is little hope of finding a formula to solve the problem of how to allocate scarce healthcare resources[28]. HCW has no clear mandate from government to undertake a systematic rationing process, and if it attempted to do so would likely find itself politically isolated[29]. Thus, out of its depth and in the spotlight, HCW appears to make rationing decisions that conform broadly to society's view of what should and should not be funded by the NHS. Herein lies a potentially large problem for bariatric surgery.

Prejuduce

If local authorities are making funding decisions skewed towards society's views, it will also make funding decisions skewed by society's prejudice. If society takes an individualistic approach to healthcare support, funding will go to services that the purchaser feels he/she may need access to at some point. Stigmatism and prejudice creates the misconception of immunity from what is widely viewed as a self inflicted disease. The attitude that obesity is self inflicted creates the misconception that obesity should be managed by adopting restraint rather than accessing medical services. Indeed this is also re-enforced by the medical profession itself portraying the illusion that obesity can be combated by better diet and more exercise[7-9]. Though the practice of healthy eating and exercise is undoubtedly the way to live a healthier lifestyle and to achieve moderate short term weight loss, it is not a long term solution to obesity and marketing it as such could be a potential mistake.

Because of the political bias to funding decisions, health condidtions that are not perceived to be a threat to the majority of the population must command a sympathy vote to politically motivate funding decisions. The majority of the population do not perceive that they will suffer from obesity, and of those who do many perceive they will not want access the bariatric service due to a lack of understanding of bariatric surgery and its benefits. **I hypothesise**

that obesity surgery does not get this sympathy vote from non obese people, and that this can be tested by obtaining opinions from a cohort of people of varying BMIs, regarding their view of obesity surgery. In the absence of this support obesity surgery will not carry enough political pressure to secure adequate funding for a reasonable service, and many people will suffer the consequences of a needlessly shortened life and the affliction of obesity related co-morbidities.

Specific Study Aims 2

1. To learn how to develop a survey using the Internet
2. To implement an online survey that can continue to obtain data after the completion of the study.
3. To obtain data from a variety of people over the Internet regarding their views on bariatric surgery, and their experience with obesity.
4. To test my hypothesis that those who do not perceive a need for NHS funded surgery do not support it.

Methodology

Planning

The 8 weeks afforded to the production of this project required careful scheduling of the available time. Week 1 was allocated to re-acquainting me with Morriston Hospital and its staff, discussing the opportunities for learning, and formulating a plan for the execution of my project. Upon discussion with Professor Baxter, who kindly agreed to supervise my project, and his academic Foundation Officer, Dr. James Moffat, I formulated the following schedule.

- Week 1
    - Determine achievable aims of the project
    - Initial identification and meeting with key staff members
    - Determine schedule
- Week 2 - 3
    - Literature search
    - Observation of bariatric surgery
    - Development of online questionnaire
    - Launch of online questionnaire
- Week 4 - 5
    - Literature search
    - Recruit GPs to assist in the distribution of Paper questionnaire
- Week 5 – 6
    - Collection of paper surveys
    - Pre-analysis of results
    - Observation of post operative bariatric clinic

- Week 7 – 8
    - Analysis of results
    - Further literature research
    - Write up

Bariatric Surgery – Morriston

Morriston Hospital (ABM NHS Trust) is home to the south Wales bariatric service performing the majority of NHS funded procedures in Wales. It is headed by Professor John N Baxter who specialises in General Surgery, Upper GI Surgery and Endocrine Surgery, and is the Secretary of The British Obesity Surgery Society (BOSS). This study was supervised by Professor Baxter.

I was fortunate to join Professor Baxter's team at a time he employed an FP1 academic – Dr. James Moffatt. Dr. Moffatt had already started similar research into the provision of funding, and had developed a paper questionnaire to obtain data from people suffering from obesity. Upon discussion of my own goals it was agreed that I would continue working on the questionnaire, and attempt to extend its reach to users on the Internet.

Questionnaire

The questionnaire (appendix 1) was pre-designed by Dr. Moffatt to be distributed among GP surgeries to target obese patients. The questionnaire (Appendix 1) was designed to collect data on a person's age, sex, weight, height, previous weight loss attempts, co-morbidities, and 3 pertinent questions regarding their personal view of bariatric surgery, specifically;

1. Have you ever considered surgery as an option for losing weight?
2. Do you think surgery for obese people should be paid for by the NHS?
3. Would you support a free group legal action that is trying to make surgery more available on the NHS?

Each questionnaire was accompanied by a covering letter to explain the source of the questionnaire (appendix 2).

Dr. Moffat wished to target obese patients, and as such had selected to distribute the questionnaire amongst GP surgeries asking GPs to pass them to their obese patients, and groups where obesity was more common. E.g. sleep apnoea clinics, or diabetes clinics.

My own research needed to obtain data from persons of all BMIs, so in addition to helping Dr. Moffatt's research I extended the questionnaire to target anyone. For this I decided the Internet was a good forum to present my questionnaire. Though I continued to collect data for Dr. Moffatt the focus of this write up will be on the Internet questionnaire and its results were analysed separately.

Online Questionnaire

From the onset I identified problems with an online questionnaire that is less of an issue with a paper one. These were

1. Sourcing participants.
2. Demonstrating credibility and encouraging participants to invest time.
3. Protecting the questionnaire from bogus answers whilst preserving the anonymity of the participants.
4. Protecting the participant's data.
5. Overcoming the technicalities of creating an online system

To offer credibility to the survey it was decided that a unique domain name should be registered with a domain registrar. The domain name obesitysurvey.info was registered with 1&1 internet, and was pointed to a website hosting account hosted by United Hosting. The online survey is still live and can continue to been seen at http//:www.obseitysurvey.info

The online questionnaire was created in a website programming language called PHP, and the data was stored in a secure encrypted SQL database supplied with the hosting. The encryption offers security of all data. No information regarding the name or address of the participant was collected to preserve anonymity. All programming was performed by me. To replace the covering letter a banner was created to appear when first visiting the page; the banner contained the covering letter and needed to be clicked to continue to the survey.

There were certain programming technicalities that needed to be addressed to ensure that the forms were completed correctly and completely, the details of which are superfluous to the context of this project. However, the most important problem to overcome was to ensure bogus or saboteur entries were kept to a minimum. It was identified at the onset that an individual could affect the outcome of the results by filling in the survey multiple times. This can be achieved by logging the IP address of each participant ensuring that only one entry per IP address is made; however, although logging IP address is legal I personally felt this was intrusive, and declaring that we are logging this information (which would be morally appropriate) would likely diminish the number of participants. I discussed this with Dr. Moffatt who agreed. Instead a system was implemented whereby each participant had to declare their email address. Upon filling out the survey a verification email containing a verification link was sent automatically. By clicking through this link the participants data was added to the study. Knowing that most users don't have several email addresses prevents them from repeating the survey ad infinitum. Any further entries from the same email address would display a message saying they had already participated in the survey. Participants were assured that their email addresses would not be used for anything other than verification, and that their details would be kept anonymous. Email addresses were stored as their hash value for cross checking. Hash value cannot be reversed to reveal the actual email address offering extra security for participant data[30].

An additional question was added to the online survey questionnaire to obtain the first part of the participant's postcode. This enabled the national online data to be automatically filtered

into Welsh and non-Welsh groups to allow Dr. Moffatt to include the data into his own Welsh study. The questionnaire is still actively obtaining data, but the analysis for this project covered 4 weeks of participation.

Recruitment

The main focus of the recruitment procedure was to collect a minimum of 50 questionnaires. This study is primarily interested in analysing the responses against the respondent's BMIs and co-morbidities. In order to adequately represent each the recruitment was targeted at communities likely to contain certain ranges of each. Having an online survey enabled its URL to be distributed via various electronic methods, namely;

1. Email
2. Internet community forums
3. Facebook

Email

A simple email explaining that I was conducting a project on obesity and bariatric surgery was sent to all my personal contacts. Within the email was the link to the online survey, and a request that each person forwarded the email to a friend they thought would not mind. I also explained that the email was not a suggestion that the recipient had obesity issues. The GP tutors at Swansea Clinical school were also emailed with a request to pass the link on to anyone they felt would be happy to receive it. I emphasised that the email could be passed to anyone, not just those with an interest in obesity.

Internet Community Forums

I was able to post a link asking for people to help my senior clinical project by participating in the survey. To accumulate a good spread of data the link was posted to a variety of different communities;

1. New Media Medicine
   This community is mainly young people who are applying for medical school. It was intended this would supply data for lower BMIs and few co-morbidities.
2. Diabetes.co.uk and britishsnoring.co.uk
   These communities were intended to supply data for people with obesity related co-morbidities.
3. weightlossforum.co.uk
   This community is mainly overweight people. It was intended this would supplied data for higher BMIs.

Facebook

Facebook offers the ability to enter a website link and then post it to everyone in your friends list. They too have the opportunity to post the link on to others. In a similar way to email this recruited a random selection of participants.

Data collection

The online survey automatically generates some simple graphical representation of the collected data to monitor its ongoing progress. This can be viewed at http://www.obesitysurvey.info/webadmin. The raw data is automatically generated and displayed at http://obesitysurvey.info/webadmin/rawdata.php, where it can be imported directly into spreadsheet software for better analysis. This data is contained in Appendix 3.

Results

General statistics

During the 4 weeks of data collection 53 questionnaires were completed. The range of ages varied from 17 to 70. 37 participants were female and 16 were male. Graphical representation of data pertinent to the discussion is shown here, however there are several graphs showing the general distribution of some of the data in appendix 4.

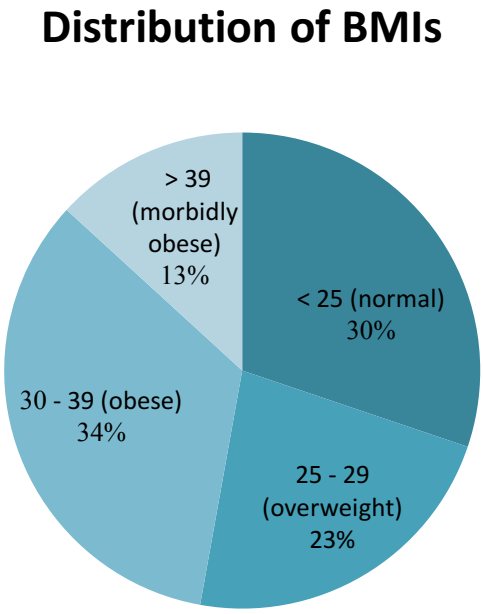


Figure 1

The range of BMIs was from 19 to 60, with good representation throughout. The classification least represented was that of morbidly obese.

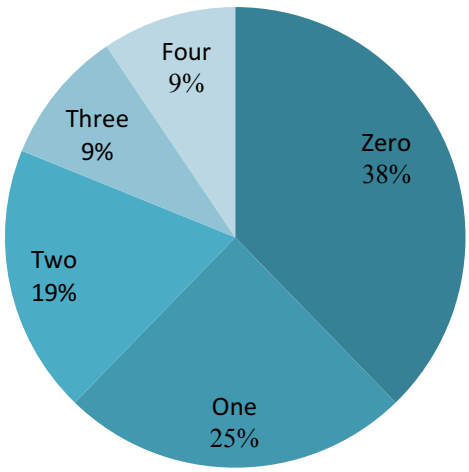


Figure 2

The cohort also represented a good range of co-morbidity number

The data sample collected appears to be well represented for a range of BMIs, co-morbidities and ages. This was by design and was a result of the recruitment process targeting different communities of the Internet to gain adequate representation across these variables. On reflection extra participants from the morbidly obese category would have been preferred.

Relationship of BMI to Co-morbidity Number

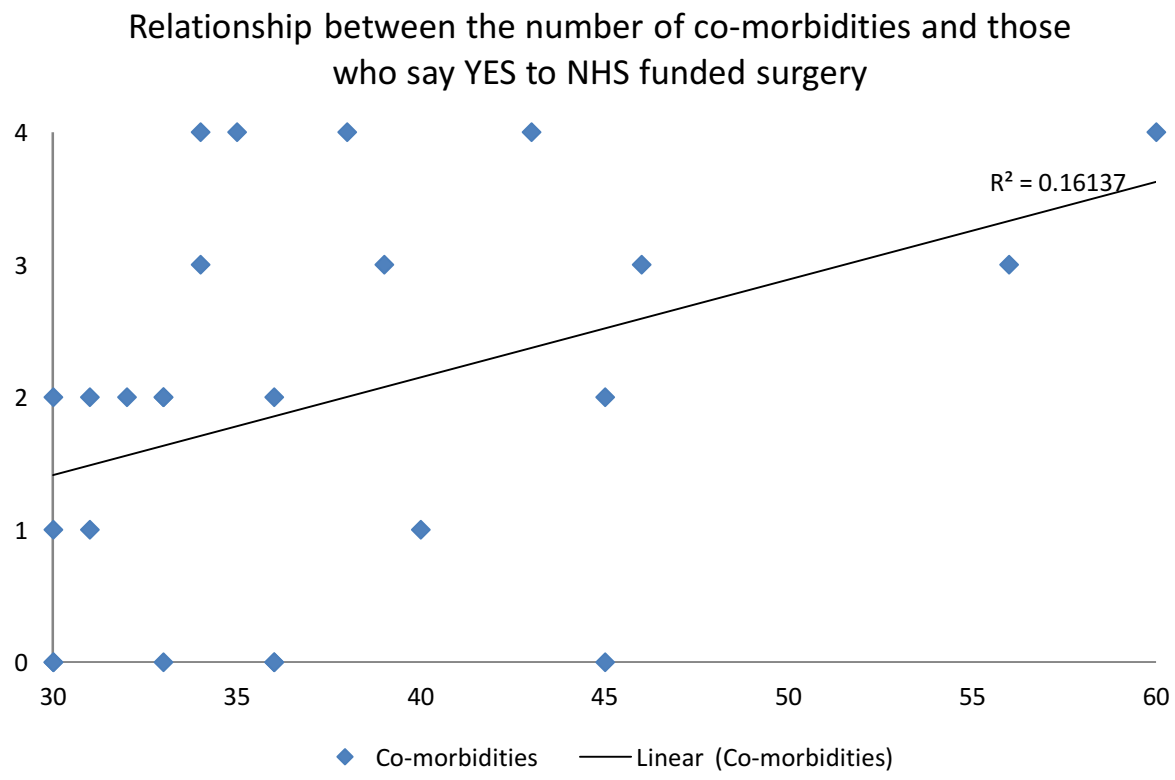


Figure 3

At BMIs greater or equal to 30 it can be seen that there is poor correlation between BMI and the number of co-morbidities present within our cohort. The product-moment correlation coefficient (r^2) is 0.061 meaning 6% of the variance in co-morbidities is associated with increasing BMI for this cohort. This allows the relationship between co-morbidities and question responses to be analysed independently of BMI without being confounded.

Have you ever considered surgery as an option for losing weight?

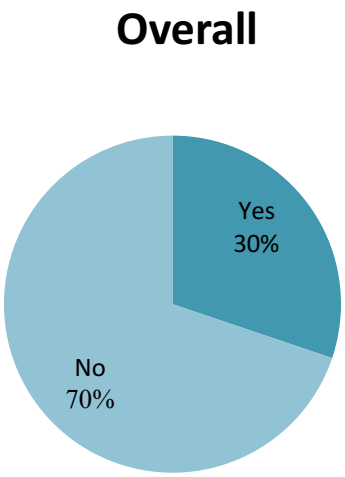


Figure 4

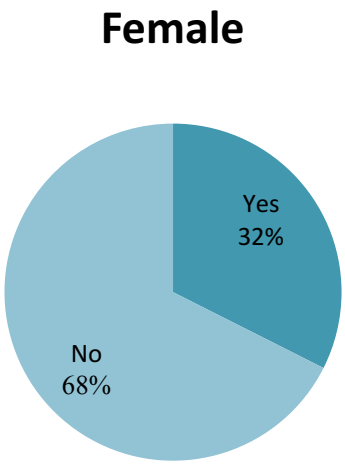


Figure 5

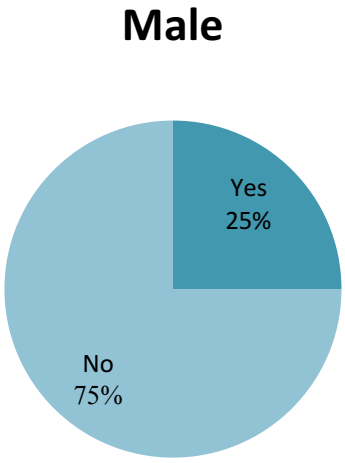


Figure 6

From the cohort of 53 the vast majority of respondents declared they had never considered surgery, which may have been representative of the large cohort (28) non obese participants. It can be observed that a larger percentage of females (3 percent) had considered surgery than males (25 percent).

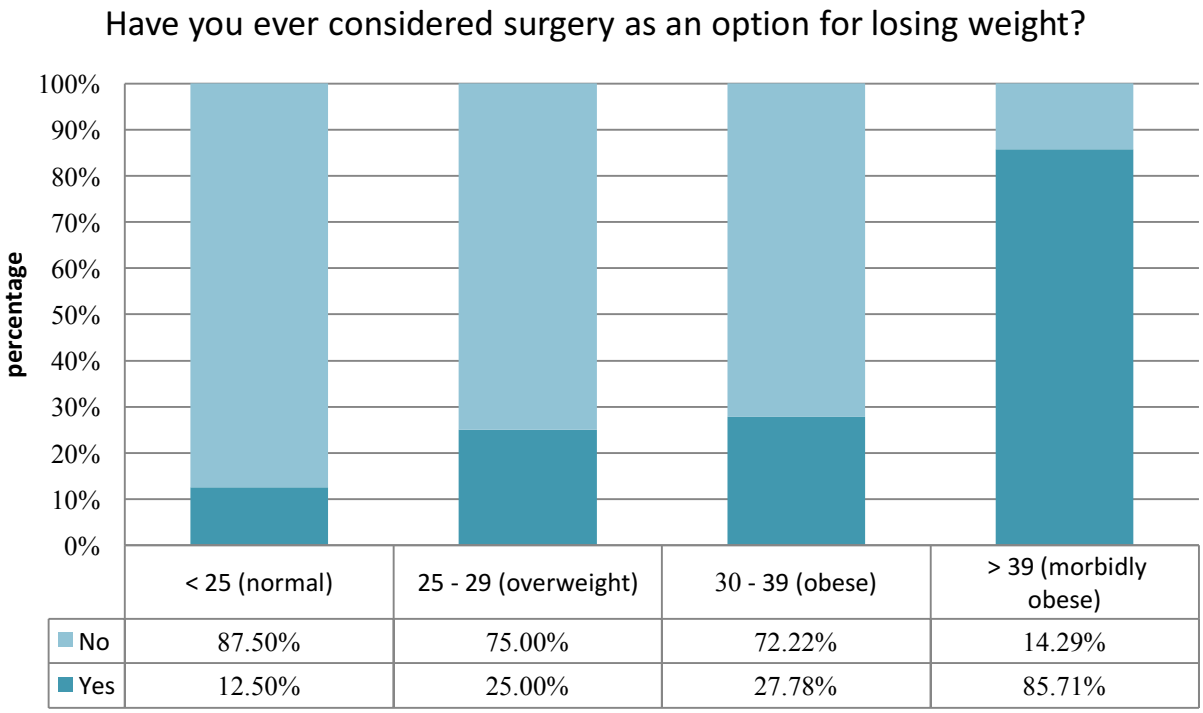


Figure 7

On further scrutiny it can be seen than very few people with a BMI less than 40 have considered surgery. However, there is sudden increase for the Morbidly Obese category. This increase is marked and corresponds to the recommendations made by NICE for offering surgery to those with a BMI of 40 or more.

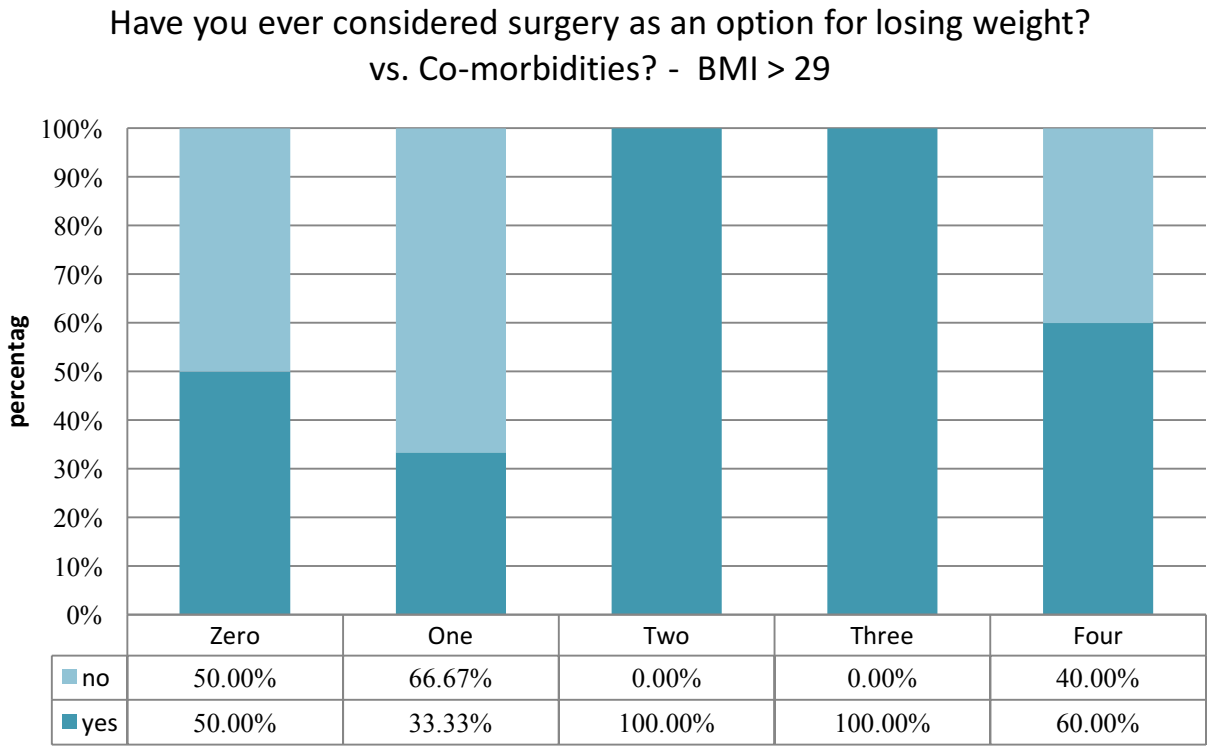


Figure 8

It can be seen that there is no obvious relationship between the numbers of obesity related co-morbidities a participant has and whether they have considered surgery.

Do you think surgery for obese people should be paid for by the NHS?

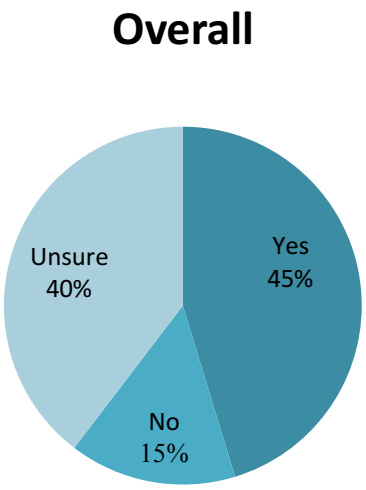


Figure 9

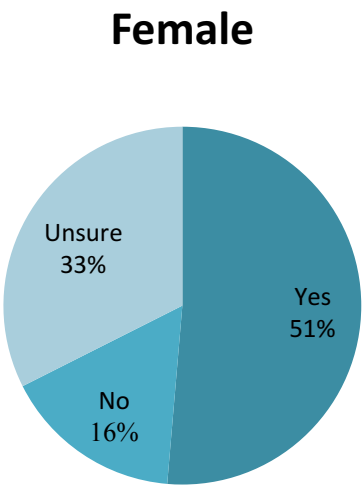


Figure 10

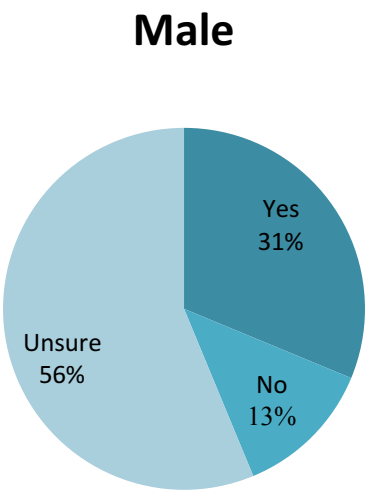
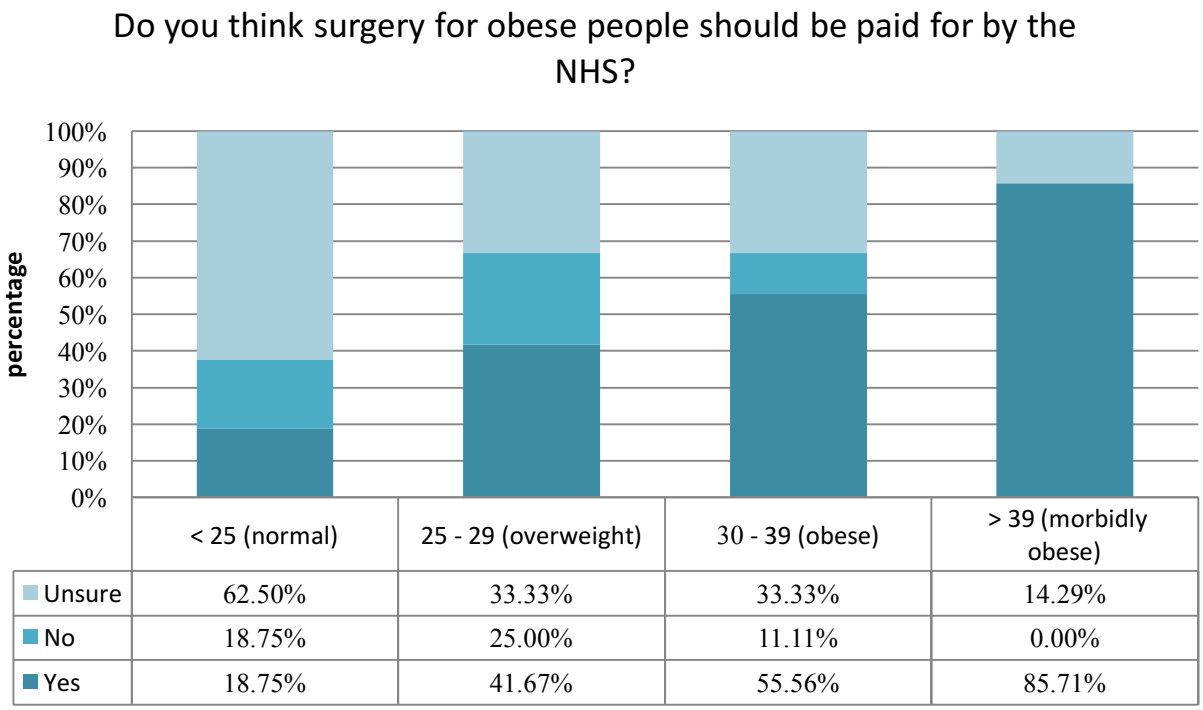


Figure 11

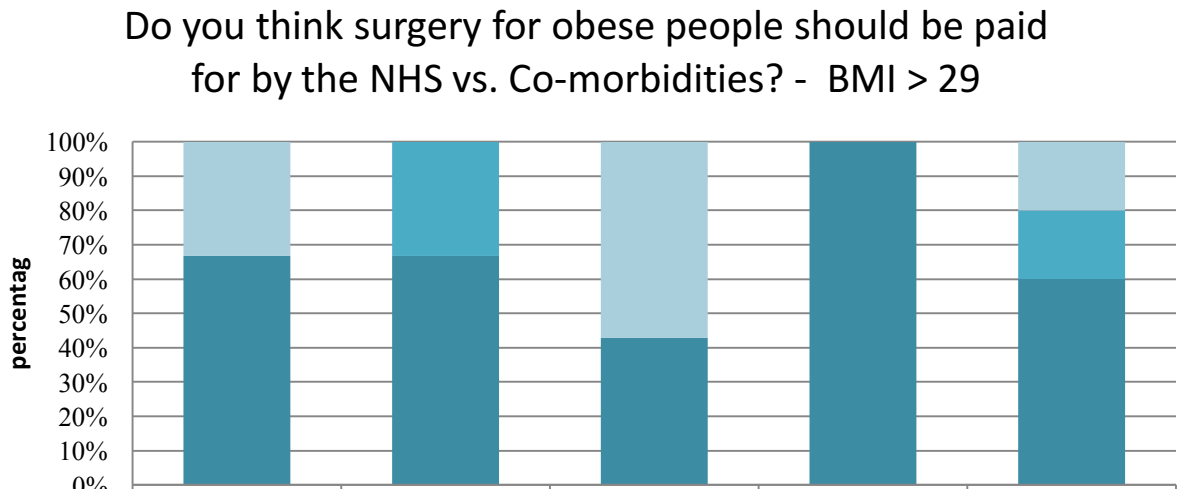
Overall 45% of people in our cohort felt that surgery should be funded by the NHS. What is of interest is that only a small proportion fall into the NO category and a significant amount (40%) are unsure. We can also see that there is significant difference in the opinion between male and female participants. While less men agree with NHS funded surgery more are unsure (56%).



	< 25 (normal)	25 - 29 (overweight)	30 - 39 (obese)	> 39 (morbidly obese)
Unsure	62.50%	33.33%	33.33%	14.29%
No	18.75%	25.00%	11.11%	0.00%
Yes	18.75%	41.67%	55.56%	85.71%

Figure 12

On deeper analysis the variation in opinions is striking. It can be seen that there is a definite correlation between a person's BMI and their agreement on NHS funded bariatric surgery. The Pearson product-moment correlation coefficient (r^2) is 0.98 meaning 98% of the variance of this percentage of people agreeing with NHS funded surgery is linked to an increasing BMI category, and a linear relationship exists. Even more interesting is that despite a decreasing trend for answering NO, there are a significant proportion of people who are UNSURE in the lower BMI categories.



	Zero	One	Two	Three	Four
unsure	33.33%	0.00%	57.14%	0.00%	20.00%
no	0.00%	33.33%	0.00%	0.00%	20.00%
yes	66.67%	66.67%	42.86%	100.00%	60.00%

Figure 13

As shown above, no correlation can be seen between co-morbidities and how participants with a BMI > 29 answered this question.

Would you support a free group legal action that is trying to make surgery more available on the NHS?

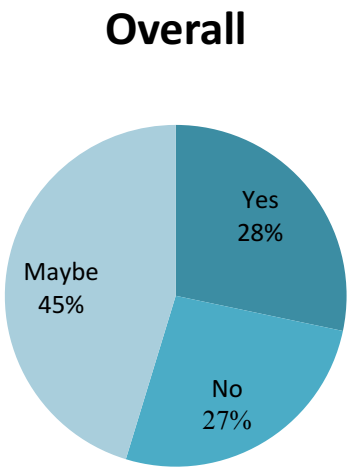


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Figure 14

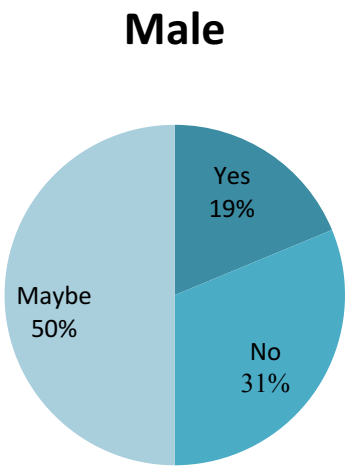


Figure 15

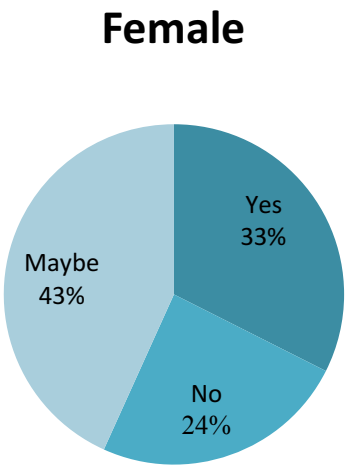
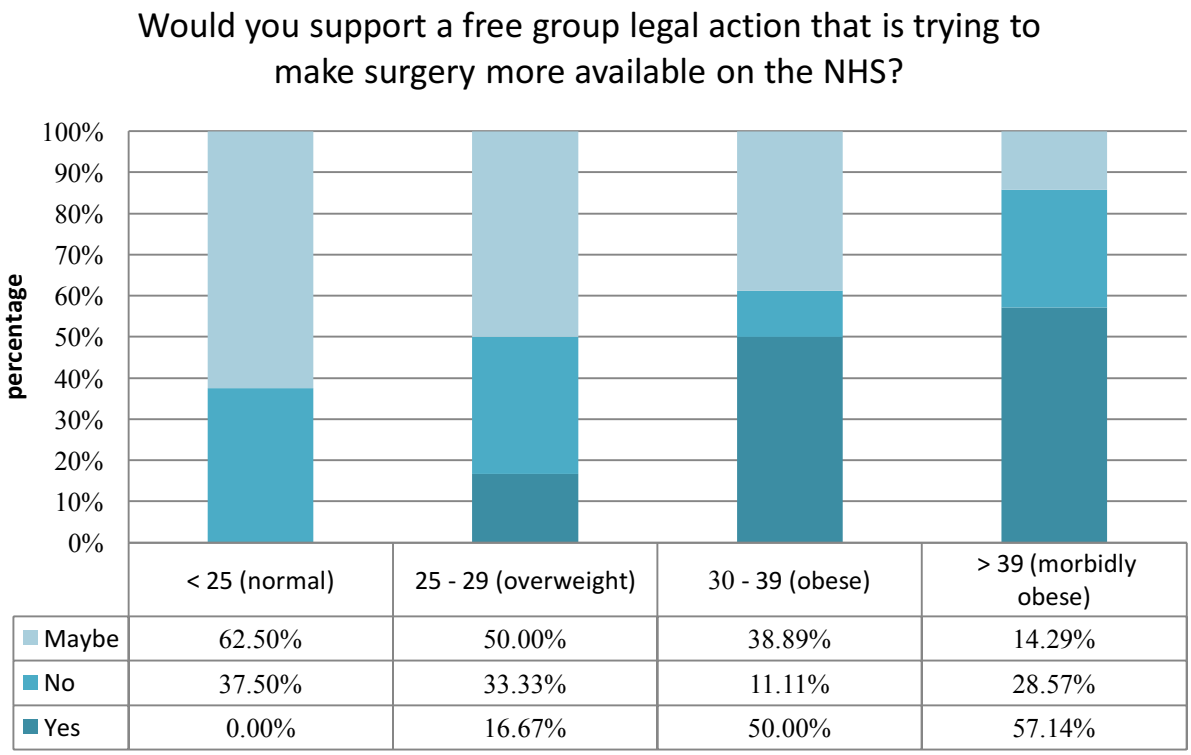


Figure 16

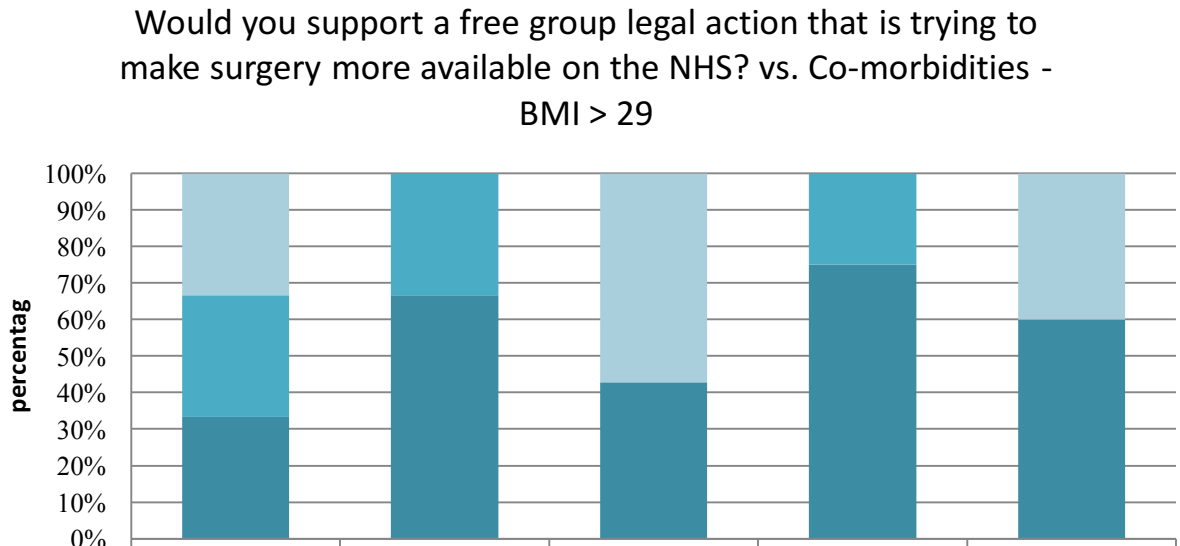
Again we can see a disparity between the male and female cohort, with women being more likely to participate in a legal action. There is also a large proportion of MAYBEs in all categories.



	< 25 (normal)	25 - 29 (overweight)	30 - 39 (obese)	> 39 (morbidly obese)
Maybe	62.50%	50.00%	38.89%	14.29%
No	37.50%	33.33%	11.11%	28.57%
Yes	0.00%	16.67%	50.00%	57.14%

Figure 17

On deeper analysis we can again see the increasing support for bariatric surgery as we move up through the BMI groups. Nobody with a normal BMI would wish to be involved in a legal action, though a high percentage MAYBEs can be seen.



	Zero	One	Two	Three	Four
maybe	33.33%	0.00%	57.14%	0.00%	40.00%
no	33.33%	33.33%	0.00%	25.00%	0.00%
yes	33.33%	66.67%	42.86%	75.00%	60.00%

Figure 18

For a third time no correlation can be seen between co-morbidities and how participants with a BMI > 29 answered this question.

Discussion

The above results clearly show that support for bariatric services increases with BMI category. At first glance it may appear intuitively obvious that a person would support a service that they perceive they need access to; however, I would argue that this distribution would be less obvious for most other services. What is conversely apparent, and more pertinent, is the increase in the number of people who do not support bariatric services as BMI category decreases. Though the distribution is the inverse of those who said yes, the inverse argument does not apply. Because one naturally supports a cause that one has a vested interest in does not automatically imply that one would not support a cause one does not have a vested interest in.

Indeed, in 2002 a survey on IVF treatment revealed that there was overwhelming public support for the NHS provision of services, yet the vast majority of the 800 participants would never require the service[31]. This disparity shows a significant lower amount of empathy for bariatric surgery from than for IVF treatment. Despite the escalating incidence of obesity, the majority of the public are not obese. With little public support for bariatric services adequate funding is unlikely to be forthcoming.

However, there is more to be gleaned from the results. Of those who did not support bariatric services a high proportion were unsure. This could represent a changing attitude towards obesity. The proportion of who actually say no is relatively small suggesting public influence over funding lies with the unsure group.

It was interesting to see that a higher proportion of female participants supported surgery than males.

As mentioned, it may not be a surprise that people with a higher BMI would be more supportive of bariatric surgery because of self interest. However, the surprising result that people opinion on bariatric surgery is not swayed by having obesity related co-morbidities. This could be explained by the participants not understanding the link between obesity related co-morbidities and the benefits of the surgery. It seems participants are only motivated by their body size. One imagines the scenario of an individual with a BMI of 35 with hypertension, diabetes, and hyperlipidaemia not realising he/she is at higher risk than a larger person with no co-morbidities. Perhaps also the participant doesn't realise his co-morbidities are linked to weight. Similar research regarding this has been done before. A study by Solimon *et al*[32] clearly demonstrated that a limited knowledge of the relationship between obesity and cancer risk. He concluded that "*patient education regarding these risks may increase awareness of the relationship between obesity and endometrial cancer among women*".

During this project I also spent considerable time speaking to online Internet communities to get a subjective view of people opinions on bariatric surgery. Some of the views expressed seemed to support the above argument. I was surprised to learn that the majority of people had a poor understanding of the risks of obesity, the poor success rate of dietary intervention, and the principles of bariatric surgery. There was a general opinion that bariatric surgery is tantamount to cosmetic surgery even from obese individuals with co-morbidities. A common misconception was that bariatric surgery worked by restricting the meal size, still leaving the patient extremely hungry. Many also believed the risk of surgery heavily outweigh the benefits. A significant majority were also convinced that dietary modification, particularly low carbohydrate regimes, was highly successful and surgery was unnecessary. Suggestions that dietary modification was shown to be a poor solution to obesity in the long term were fiercely rebuked.

Fig. 6 demonstrates an unusual trend where those with a BMI < 40 have never considered surgery, yet 86 percent of BMI 40 or more have. This is also the BMI at which NICE recommends surgery as an option. This may be the result of participants actively seeking out information knowing that they could be eligible. There is no shortage of good evidence for bariatric surgery, and once motivated to seek it perhaps the previously unsure participant (as is seen in the graph) becomes convinced. There is evidence to suggest that patients who elect to undergo surgery are the best candidates, and are well informed[33]. Combined with the other results already mentioned this suggests better patient information is required.

The Future

Funding decisions are primarily political in nature, and without policy change public opinion will take priority over technical arguments. Supporters of the political and technical methodologies agree that a common ground needs to be met to provide a more robust system. Until then bariatric services are at the mercy of public opinion. The research done here suggests there is a lack of understanding about obesity which is likely affecting opinion. However, an air of indecision suggests the tide may be turning on public support for obesity surgery. With concerted effort to impart better information to the public, there is the chance obese people can eventually get the treatment they deserve.

Conclusions

Participants with higher BMIs are more likely to support the need for bariatric services, though lower BMIs were undecided. Participants did not relate the need for surgery with obesity related co-morbidities. Women are more supportive of bariatric surgery than men, but more men are undecided. Obesity surgery appears not get the sympathy vote from non obese people, and that this is leading to resistance to allocating funds for an efficient service. Patient education may help increase their awareness of the risks of obesity, and the benefits of surgery, which will likely result in an increase in funding for bariatric services.

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Appendix 1

Obesity Surgery Survey

Thank you for taking time to participate in this survey. All responses will be kept strictly *anonymous.* If you have any questions please feel free to contact me on 07983 433160 or at 360501@swansea.ac.uk

1. **Age?**

2. **Sex?**

3. **What measures are you currently using, of have used in the past to lose weight?**

- Altering your diet ☐
- Medicines ☐
- Doing more exercise ☐
- Complementary ☐ therapies
- Slimming clubs ☐
- Nothing ☐
- Other, please specify ☐ **How much weight did you lose?**.....

4. **How much weight have you lost on the above measures?**

- Altering your diet ☐
- Medicines ☐
- Doing more exercise ☐
- Complementary ☐ therapies
- Slimming clubs ☐
- Nothing ☐
- Other ☐

5. **Do you suffer from any of the following health problems?**

- Diabetes ☐
- High blood pressure ☐
- High cholesterol ☐
- Sleep apnoea ☐
- Depression ☐
- Joint problems ☐
- other, please specify ☐ .....

6. **Could you please tell us your current: Weight? Height?**

7. **Have you ever considered surgery as an option for losing weight?**
   Yes No

8. **Do you think surgery for obese people should be paid for by the NHS?**
   Yes No Unsure

9. **Would you be interested in joining a free group legal action so that surgery was more available on the NHS?**
   Yes No Maybe

Appendix 2

Table 1: Online Obesity Survey Results

Age	Weight Kg	Height m	BMI	Sex	Co-Morbidities	Measures	Surgery Qs.
41	138	1.85	40	♂	High blood pressure	Altering Diet → 3.5 stones	Considered surgey? → yes Should be on the NHS? → yes Consider legal action? → yes
41	112.49	1.57	45	♀	NONE	had gastric bypass → 0	Considered surgey? → yes Should be on the NHS? → yes Consider legal action? → no
44	169.64	1.93	46	♂	Sleep apnoea Depression Joint problems	Altering Diet → 14 lbs Medicines → 6lbs Excercise → 28 lbs Slimming Clubs → 70-80 lbs	Considered surgey? → yes Should be on the NHS? → yes Consider legal action? → no
58	108	1.75	35	♂	High blood pressure High cholesterol Sleep apnoea Depression	Altering Diet → 10lbs Excercise → 10lbs	Considered surgey? → no Should be on the NHS? → yes Consider legal action? → maybe
33	114.31	1.7	39	♀	High cholesterol Depression Joint problems	Medicines → 24 lbs Excercise → 14 lbs Slimming Clubs → 11lbs	Considered surgey? → yes Should be on the NHS? → yes Consider legal action? → yes

55	96.62	1.73	32	♀	Sleep apnoea Joint problems	Altering Diet → 10lbs Excercise → 4 lbs Slimming Clubs → 20 lbs	Considered surgey? → no Should be on the NHS? → yes Consider legal action? → yes
60	75.3	1.7	26	♀	Joint problems	Altering Diet → 2-4 lbs over 2 weeks not needed to → 4lbs	Considered surgey? → no Should be on the NHS? → yes Consider legal action? → yes
61	106.14	1.8	33	♂	High blood pressure Joint problems	NONE	Considered surgey? → no Should be on the NHS? → yes Consider legal action? → yes
21	74.39	1.8	23	♀	NONE	NONE	Considered surgey? → no Should be on the NHS? → unsure Consider legal action? → maybe
21	61.69	1.63	23	♀	NONE	Excercise → 7 lbs Eating less → ? lbs Not many!	Considered surgey? → no Should be on the NHS? → unsure Consider legal action? → maybe
24	82.55	1.7	29	♂	NONE	Altering Diet → 5 lbs Excercise → 5 lbs	Considered surgey? → no Should be on the NHS? → unsure

							Consider legal action? → maybe
29	88.9	1.65	33	♀	NONE	Medicines → 0 lbs Excercise → 0 lbs Slimming Clubs → 14 lbs	Considered surgey? → yes Should be on the NHS? → yes Consider legal action? → yes
60	61.69	1.63	23	♀	NONE	Altering Diet → 5 lbs Excercise → not sure Slimming Clubs → 21lbs	Considered surgey? → no Should be on the NHS? → yes Consider legal action? → no
37	92.08	1.65	34	♀	Sleep apnoea Depression Joint problems	Altering Diet → 14 lbs	Considered surgey? → yes Should be on the NHS? → yes Consider legal action? → yes
45	57.61	1.63	22	♀	NONE	Excercise → 7 lbs	Considered surgey? → no Should be on the NHS? → unsure Consider legal action? → no
24	60.33	1.57	24	♀	High cholesterol Joint problems	Altering Diet → 7 lbs Excercise → 7 lbs	Considered surgey? → no Should be on the NHS? → no Consider legal action? → no
23	53.52	1.57	22	♀	High blood pressure High cholesterol	Altering Diet → 28 lbs Medicines → 28 lbs	Considered surgey? → no Should be on the NHS? → yes

							Consider legal action? → maybe
28	70	1.65	26	♀	NONE	Altering Diet → 12 lbs Excercise → 12 lbs	Considered surgey? → no Should be on the NHS? → yes Consider legal action? → maybe
51	95	1.75	31	♂	Diabetes	Altering Diet → 14lbs Excercise → 28lbs	Considered surgey? → no Should be on the NHS? → no Consider legal action? → no
62	84	1.82	25	♂	Diabetes High blood pressure	Altering Diet → 38 lbs	Considered surgey? → no Should be on the NHS? → no Consider legal action? → no
70	76.2	1.73	26	♂	Diabetes	Altering Diet → 15 lbs Excercise → 7 lbs reduced carb → 15 lbs	Considered surgey? → no Should be on the NHS? → unsure Consider legal action? → no
45	80	1.9	22	♂	Diabetes	Altering Diet → 60 lbs	Considered surgey? → no Should be on the NHS? → unsure Consider legal action? → maybe
61	89	1.72	30	♀	Diabetes High blood	Altering Diet → ~17Kg	Considered surgey? → no

					pressure	Excercise → 0 Slimming Clubs → ~10kg	Should be on the NHS? → unsure Consider legal action? → maybe
21	112.04	1.57	45	♀	Depression Joint problems Sensorineural deafness	Altering Diet → 1 stone, not sustained Excercise → 2 stone, also not sustained	Considered surgey? → yes Should be on the NHS? → unsure Consider legal action? → maybe
28	57.15	1.58	23	♀	NONE	Altering Diet → ??? lbs Excercise → ??? lbs	Considered surgey? → no Should be on the NHS? → unsure Consider legal action? → maybe
33	74	1.57	30	♀	NONE	Altering Diet → 00 lbs Excercise → 10lbs	Considered surgey? → no Should be on the NHS? → unsure Consider legal action? → no
44	133.36	1.88	38	♂	Diabetes High blood pressure High cholesterol Depression	Altering Diet → 11.5kg	Considered surgey? → yes Should be on the NHS? → unsure Consider legal action? → yes
43	99.79	1.8	31	♂	Diabetes High blood pressure	Altering Diet → 2 stone Excercise → as above Low carb diet → all above 2 stone	Considered surgey? → no Should be on the NHS? → unsure Consider legal action? →

							maybe
24	60	1.63	23	♀	NONE	Altering Diet → 3lbs Excercise → 6 lbs	Considered surgey? → no Should be on the NHS? → no Consider legal action? → no
67	111.58	1.83	33	♂	High blood pressure Joint problems	Altering Diet → 10lbs Excercise → ? Slimming Clubs → 10lbs	Considered surgey? → no Should be on the NHS? → unsure Consider legal action? → maybe
59	52	1.65	19	♀	Diabetes	Altering Diet → 46lbs Excercise → 46lbs	Considered surgey? → no Should be on the NHS? → unsure Consider legal action? → maybe
41	143.34	1.6	56	♀	Diabetes Depression Joint problems	NONE	Considered surgey? → yes Should be on the NHS? → yes Consider legal action? → yes
53	65.32	1.68	23	♀	Joint problems	NONE	Considered surgey? → no Should be on the NHS? → unsure Consider legal action? → no
49	73	1.73	24	♂	Diabetes High blood pressure High cholesterol	Altering Diet → 7 lbs Excercise → 7lbs	Considered surgey? → no Should be on the NHS? → unsure

					IHD		Consider legal action? → no
50	127.01	1.73	43	♀	Diabetes High blood pressure High cholesterol Depression	Altering Diet → 20lbs Excercise → 30lbs BOTH ABOVE → 50lbs	Considered surgey? → no Should be on the NHS? → yes Consider legal action? → yes
53	72	1.55	30	♀	Diabetes	Altering Diet → 29 lbs	Considered surgey? → no Should be on the NHS? → yes Consider legal action? → yes
46	100	1.68	36	♀	Diabetes High blood pressure	Altering Diet → 7 lbs Medicines → 14 lbs Excercise → 0 lbs Slimming Clubs → 35 lbs	Considered surgey? → no Should be on the NHS? → yes Consider legal action? → yes
25	76	1.72	26	♂	NONE	Altering Diet → 13 lbs Medicines → 0 lbs Excercise → 12 lbs Complementary Therapies → 0 lbs Slimming Clubs → 0 lbs	Considered surgey? → no Should be on the NHS? → unsure Consider legal action? → maybe
38	98.43	1.65	36	♀	NONE	Altering Diet → 28 lbs Excercise → 28 lbs Slimming Clubs → 12 lbs	Considered surgey? → yes Should be on the NHS? → yes Consider legal action? → maybe

43	98	1.7	34	♀	Diabetes High blood pressure High cholesterol Joint problems	Altering Diet → 150 Excercise → 150	Considered surgey? → no Should be on the NHS? → no Consider legal action? → maybe
42	76.2	1.65	28	♀	Joint problems	Slimming Clubs → 14 lbs Cambridge Diet → 36 lbs	Considered surgey? → yes Should be on the NHS? → yes Consider legal action? → yes
48	72.57	1.63	27	♀	Sleep apnoea	Altering Diet → 8 lbs Excercise → 7lbs Slimming Clubs → 7lbs	Considered surgey? → no Should be on the NHS? → no Consider legal action? → no
41	74.84	1.63	28	♀	Asthma	Altering Diet → 14 lbs Excercise → 14lbs Slimming Clubs → 7lbs	Considered surgey? → yes Should be on the NHS? → yes Consider legal action? → maybe
21	58.51	1.6	23	♀	NONE	Altering Diet → 5kg Excercise → 1kg	Considered surgey? → yes Should be on the NHS? → yes Consider legal action? → maybe
21	58.97	1.7	20	♀	NONE	Altering Diet → 4 lbs Excercise → 9 lbs	Considered surgey? → no Should be on the NHS? → no

							Consider legal action? → maybe
25	78.02	1.63	30	♀	NONE	Altering Diet → 14 lbs Slimming Clubs → 21 lbs	Considered surgey? → no Should be on the NHS? → yes Consider legal action? → maybe
18	88.9	1.57	36	♀	NONE	Altering Diet → 6 lbs Excercise → 2 stones	Considered surgey? → no Should be on the NHS? → unsure Consider legal action? → yes
28	61.69	1.65	23	♀	NONE	Altering Diet → 12 lbs Excercise → 10lbs	Considered surgey? → no Should be on the NHS? → unsure Consider legal action? → maybe
17	73.03	1.65	27	♀	NONE	Altering Diet → 12lbs Excercise → 12lbs	Considered surgey? → yes Should be on the NHS? → no Consider legal action? → no
17	65	1.73	22	♂	Depression Asthma	Altering Diet → ??? lbs Excercise → ??? lbs	Considered surgey? → yes Should be on the NHS? → unsure Consider legal action? → maybe
19	74	1.63	28	♀	Depression	Altering Diet → 2 lbs	Considered surgey? → no

						Excercise → 2 lbs	Should be on the NHS? → unsure Consider legal action? → maybe
54	157.4	1.63	60	♀	High blood pressure High cholesterol Sleep apnoea Joint problems RA, idiopathic intracranial hypertension	Altering Diet → 9lbs Medicines → 28 lbs Excercise → 42lbs Slimming Clubs → 22 lbs Jaw wired → 18 lbs	Considered surgey? → yes Should be on the NHS? → yes Consider legal action? → yes
51	88.9	1.83	27	♂	Diabetes	Altering Diet → 90 lbs Excercise → 0 lbs	Considered surgey? → no Should be on the NHS? → yes Consider legal action? → maybe
44	111.13	1.73	37	♂	Diabetes	Altering Diet → 28lbs Medicines → 35 lbs Excercise → 10lbs Slimming Clubs → 22lbs	Considered surgey? → no Should be on the NHS? → unsure Consider legal action? → no
22	60	1.69	21	♀	Joint problems	Altering Diet → 8 Excercise → 8	Considered surgey? → no Should be on the NHS? → no Consider legal action? → no
54	79.38	1.83	24	♂	Diabetes High blood pressure	NONE	Considered surgey? → no Should be on

					High cholesterol Depression angina+		the NHS? → no Consider legal action? → no
64	152.41	1.83	46	♂	Diabetes High blood pressure Sleep apnoea Depression Joint problems	Altering Diet → ??? lbs Medicines → ??? lbs	Considered surgey? → yes Should be on the NHS? → yes Consider legal action? → yes

APPENDIX 3

Distribution of Co-morbidity and Weight loss measures with BMI

This data is loosely scattered, though there is a general trend for increased co-morbidity

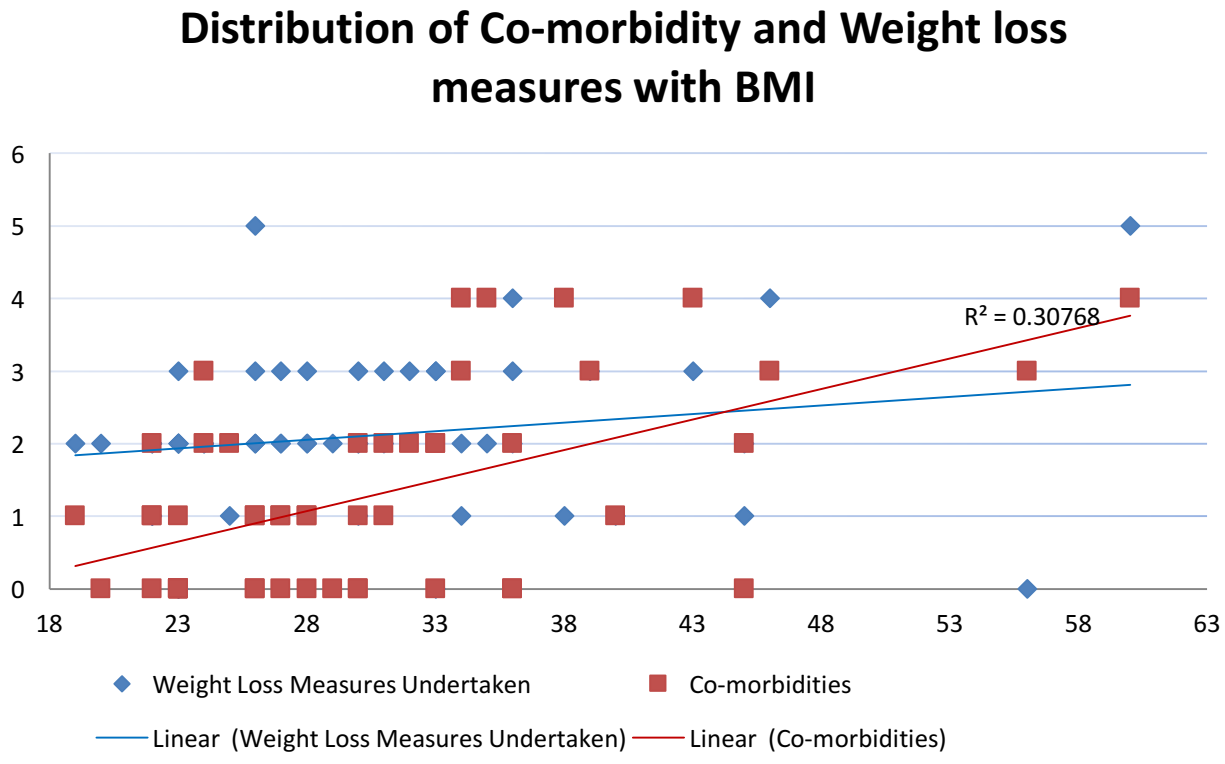

Figure 19

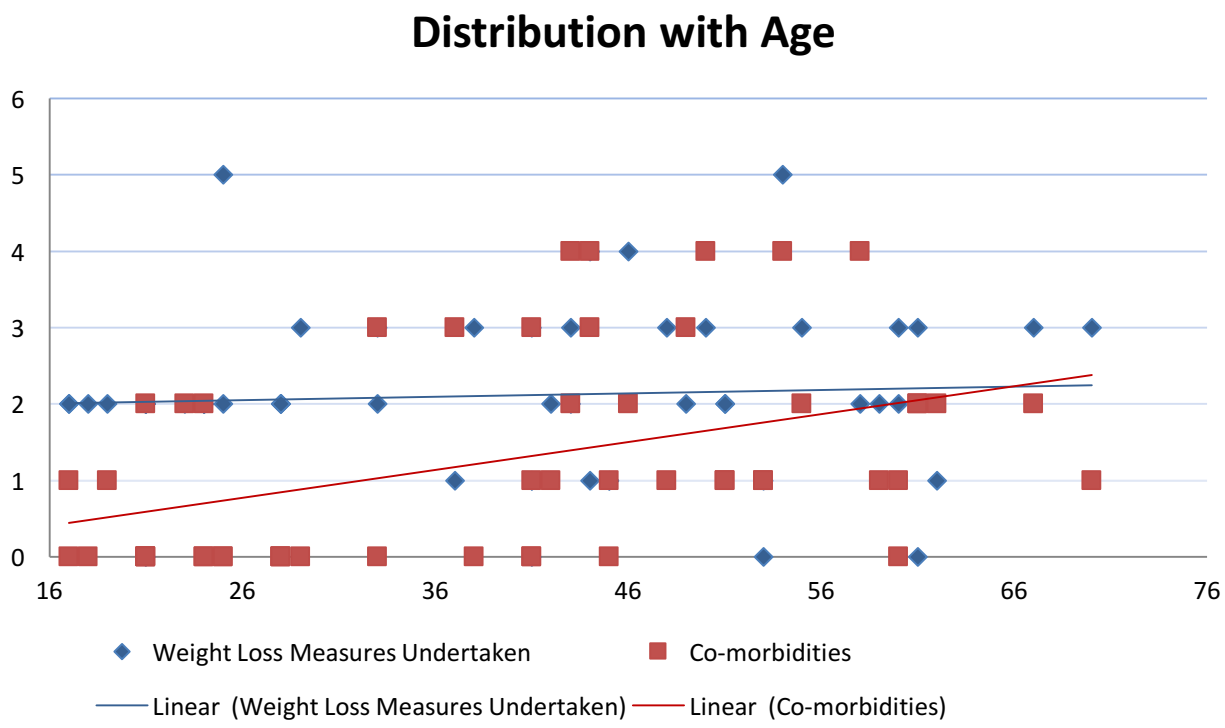

Figure 20

Average BMI vs. Age

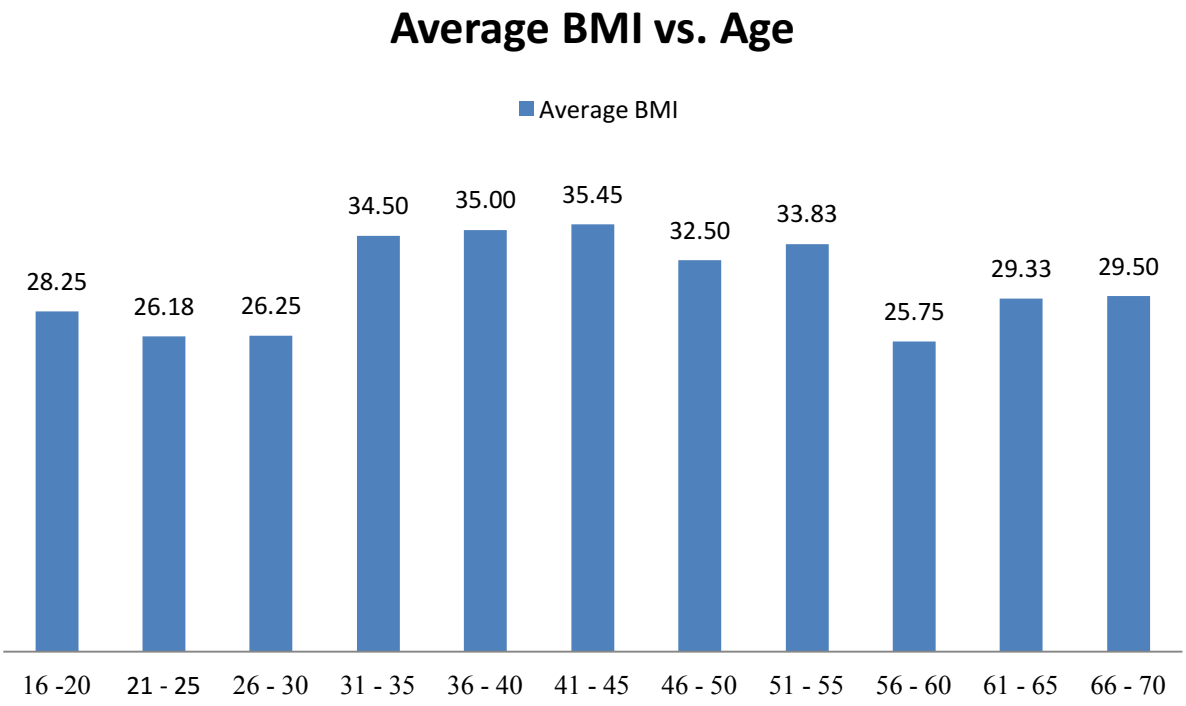

Figure 21